

Abstract

In a many biological and physical sciences studies, a set of techniques have been developed to analyse the relationship between the circular and linear data derived from the geographical positioning system (GPS) telemetry to describe animal movement. Yet, many of the models used by ecologists do not provide a link between the circular and linear variables. This chapter demonstrates the application of the circular-linear regression in describing such a relationship. We describe numerical methods of obtaining maximum likelihood model parameter estimates. We discuss the technical limitations of the model through simulation and application to real elephant movement data with covariates collected from Kruger national park, South Africa. These results provide a new statistical paradigm for understanding the need to landscape features in elephant and similar animal models and evolutionary forces driving unpredictable.